

Vol. VII

JANUARY, 1913

No. 1

# BRILL MAGAZINE



Shelton Square  
Buffalo, N.Y.






## BRILL MOTORBUS BODIES

An electric railway man from eastern Pennsylvania, for whom we've built cars for many years, came in the other day to see us about motorbus bodies for use as feeders and extensions of his railway. "Your man told me," he said, "and I think he's right—that for work so much like trolley cars, the bodies ought to be designed and constructed by trolley car builders; your experience tells you what to put in to make them stand the racking of running over all sorts of pavement and the vibrations of the engine—and when it comes to getting the most seats out of the smallest floor space, you ought to know best. More than that—you know how to cut down weight and still keep the thing strong enough to do the work and live under it."

**THE J. G. BRILL COMPANY**  
PHILADELPHIA, PENNSYLVANIA



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EDWARD G. CONNETTE

PRESIDENT, INTERNATIONAL RAILWAY COMPANY



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## EDWARD G. CONNETTE

**E**DWARD G. CONNETTE, president of the International Railway Company, Buffalo, N. Y., was born at Austin, Ind., December 29th, 1864. In 1890, after several years of steam railroad experience with the Pennsylvania and Louisville & Nashville Railroads, he entered the electric railway field as superintendent of the Nashville Street Railway Company, and after one year was appointed its general manager. In 1897 he became chief engineer of the Cumberland Electric Light & Power Company in addition to his other position, and three years later resigned both to become vice-president of the Syracuse Rapid Transit Railway Company, which position he retained till 1905, when he became general manager of the Worcester Consolidated Street Railway Company and its subsidiary lines. He was appointed transportation engineer of the Public Service Commission of New York, First District, in 1909, and, in addition to having jurisdiction over the New York subway question and grade-crossing elimination in Greater New York, acted largely in an advisory capacity for the commission in corporate matters. This post included full charge of the inspection and equipment bureaus, which pass on cars and other electric railway equipment for New York City, and of the accident bureau of the commission's laboratory for testing meters. His resignation from that position preceded his election as vice-president of the International Railway in May of last year, and his elevation to the presidency of the system, following a general financial reorganization, has just been announced. The lines under his supervision include the street and interurban roads serving Buffalo, Niagara Falls and Lockport, N.Y. Mr. Connette has been active in electric railway association affairs, and during 1897-8 served as third vice-president of the American Street Railway Association, and from 1903 to 1904 as president of the Street Railway Association of the State of New York.

## CONDITIONS WHICH GOVERN THE TYPE OF CAR FOR CITY SERVICE

BUFFALO, NEW YORK\*

BUFFALO, the second city of the Empire State, is situated on the eastern shore of Lake Erie and the east bank of the Niagara River, 22 miles south of Niagara Falls. Its position, almost midway between New York, Boston and Chicago and at the eastern terminus of the bulk of marine traffic on the Great Lakes, together with its comprehensive railroad connections, have been the prime factors in its development as one of the greatest traffic interchange and industrial centers in America. Buffalo is virtually the eastern limit of the rich middle west, and is connected with every part of that large territory, as well as with all of Canada and every other portion of the United States, by 15 steam railroad and terminal companies. It is an important interurban center, with connections to the north, east, west and southwest, and the starting point of a Great Lakes marine traffic that approximates 5,000,000 tons per annum, reaching all important lake cities. Its significance as an interchange and commercial center is exemplified by the 500 miles of steam railroad tracks within the city limits, a waterfront 20 miles in length, of which 8 or 10 miles are docks and piers, and by the receipt of 200,000,000 bushels of grain in 1906; 100,000,000 barrels of flour and 10,000,000 head of cattle; a lumber trade of 200,000,000 feet; the handling of about 15,000,000 pounds of fish, and an enormous coal and iron tonnage every year. It is also an important Canadian frontier port, with imports amounting to \$6,708,919, and \$26,192,563 in exports, in 1908.

As a manufacturing center it is eclipsed, in the state, only by New York. In 1900 the value of its manufactures was

\* The forty-ninth article of this series.







\$122,230,061, and in 1905 the factory value, alone, of its products was \$147,377,873. Buffalo produces principally meats, refined oil, soap and candles, flour and grist milling, malt liquors, lumber, commercial iron and steel, castings and machinery, and clothing.

In 1820 the city had 2000 inhabitants, and it was not



BUFFALO TRAFFIC CONDITIONS AND CARS. Main and Seneca Streets, heaviest traffic point on system. During rush hours, from 6 to 9 A.M. and 5 to 6.30 P.M., cars pass every  $18\frac{2}{3}$  seconds. Important intersection in through-routing

until the opening of the Erie Canal, in 1825, that the development bringing its population to 423,715 in 1910, was given impetus. The growth of the city, politically and commercially, has been rapid and consistent and in nowise restricted, for the comparatively level character of the surrounding country allowed it to spread as widely as necessary. It was a natural consequence of such an environment that the business section should be near the lake shore, where maritime activity was



to become so great. With the growth of the city the railroad facilities were naturally increased; the enormous freight yards became a part of Buffalo to the extent of thousands of acres around and in the city, and with their many lines encircled it completely.

The large available territory permitted wide, shaded streets. Residentially, the city spread toward the north and



BUFFALO TRAFFIC CONDITIONS AND CARS. Lafayette Square, looking west on Court Street, near the focal point of traffic. Other is Main Street. Building on left street corner, International Railway interurban ticket office. Lockport and Niagara Falls interurban trains come south on Main Street, loop west through Court Street and turn north on Delaware Avenue

east more than to the south, because of the many railroads and industrial plants in that section, and assumed generally a form like an opened fan covering 42 square miles, with the business section as the handle. There are many beautiful parks, with a total of 1030 acres, connected, where possible, by a well-planned system of boulevards. The largest of these is Delaware Park, in the northern part of the city, where the

Pan-American Exposition was held in 1901. Thousands of strangers visit Buffalo every year in conjunction with their visits to Niagara Falls.

The map on page 3 shows clearly the general scheme of the Buffalo street railway lines. From Shelton Square, in the heart of the city, lines radiate in every direction, except to the west, where is Lake Erie. The system is simply a natural result of the city's development and an effort to provide its growing districts with street railway facilities. In the horse-car days many small, independent companies provided a rather haphazard service, until the International Railway Company was formed to operate all the lines as a single system. Since that time the continually improving character of the service and equipment has reflected the general effort to provide the best for the city's interests, and this is shown par-



BUFFALO TRAFFIC CONDITIONS AND CARS. View north on Main Street from Terrace. At corner on the right, Exchange Street, with heavy traffic from Union Station, meets Main Street.  
N.Y. C. & H. R. R. R. tracks pass under the square through tunnel





BUFFALO TRAFFIC CONDITIONS AND CARS. Main, Genesee and Huron Streets, one of the busiest points on the system. Cars to north and northeast separate here

ticularly at the present time, when the older method of operating lines from a sort of central terminal is being gradually changed into a complete method of through-routing that will eventually cover every combination of existing lines that will conform to the plan.

As in many cities in this country, certain streets grew in importance, and as a result every car line was focused upon them, with the consequent congestion and slow movement that naturally affected the efficiency of the entire system. There was much interlacing of lines, hampering operation and producing immense volumes of traffic at some points, and a scattering at others not at all far distant. By a gradual process of elimination, several lines were removed from the most congested streets to nearby parallel streets, not only doing away, to a large extent, with the undesirable conges-

tion, but also increasing the capacity of the central terminal system. Smooth operation was further effected by two high-speed interurban lines which ran through two of the principal traffic streets—one to Niagara Falls, the other to Lockport, N.Y.—both operated by the International Railway. Complications were occasioned by the fact that, in going from one part of Buffalo to another, the route invariably led through the congested business area, bringing many passengers into that region who should, logically, have reached their destinations by more direct routes. One of the first steps to relieve this situation was the inauguration of a through-route from a point near Buffalo Creek, in the southern part of the city, that practically describes an arc of a circle through the eastern and northern sections, to its terminal at Black Rock. Several other through-routes have also been established, and it is the aim of the International Railway Company to continue the through-routing policy, so that no line will terminate at the center of the city, but run directly across, passing through the center *en route*. The resultant simplified operation and the greater carrying capacity of the lines becomes at once apparent with the removal of the usual terminal delays from the congested center to the remote, light-traffic points at the terminals.

The International Railway Company operates 376½ miles,



BUFFALO TRAFFIC CONDITIONS AND CARS. Near-Side car, standard city car of International Railway. Same as standard cars of Chicago City Railway and Philadelphia Rapid Transit. Brill semi-convertible window system; steel bottom-frame; Brill No. 39-E trucks





BUFFALO TRAFFIC CONDITIONS AND CARS. Near-Side car. Circular seat at rear, 5; transverse seats, 32 longitudinal seat at left, 10; longitudinal seat at right, 7; total, 54

4 ft. 8½-in. gage, including the interurbans, the city lines in Buffalo, Niagara Falls, Lockport and Olcott Beach, and the scenic interurban lines in Canada along the Niagara Gorge. In Buffalo, alone, the mileage is 242, reduced to single-track basis, of which 91.50 miles are double track, 39 miles single and 20 miles in car houses, sidings and crossovers; radius of shortest curve, 32½ ft. The steepest grades, which are met only on the approaches to the long viaducts over the freight yards, are 4 per cent and from 400 to 700 ft. in length. Much of this mileage is, of course, in the business section and normally 280 cars are required for the service; but during the "rush hours," from 6 to 9 A.M., with the peak on the east side from 6 to 7 and on the west from 7 to 8—and in the evening from 5 to 6.30, with the peak at 6 o'clock—560 cars are in use. In cases of abnormally heavy traffic, additional cars, bringing the total to 600, are available, but it is rarely necessary to operate so many. During the hours of heaviest

traffic, the point of greatest congestion is the crossing of Main and Seneca Streets, where the cars of two double-track lines pass at the rate of 196 per hour, or at intervals of  $18\frac{2}{3}$  seconds between cars. Another very heavy traffic and transfer point is that at Shelton Square, shown in the engraving on the front cover. The entire Main Street traffic passes this point; cars turn from Main Street into North Division Street at Ellicott Square—the large building on the right in which are the offices of the International Railway Company—and the loop in the foreground is used by another line running along Niagara Street toward the northwest. All the energy for the operation of the system is obtained from the enormous hydro-electric plants at Niagara Falls and a steam auxiliary at Buffalo.

Up to within the last year and a half there were several types of both single- and double-truck cars in use, but large prepayment cars, built by the G. C. Kuhlman Car Company and mounted on Brill No. 27-F pivotal trucks, were standard on the system. September 17, 1911, 35 Near-Side cars, such as those now used by the Philadelphia Rapid Transit Co. and the Chicago City Railway Co., were placed in service on the Grant Street line, and on October 15 of that year 26 additional cars of the same type were put on the Clinton Street line and subjected to thorough comparative tests with the former cars. The cars were built by The J. G. Brill Company. During these tests, in which the cars were operated in revenue service, they established a loading and unloading efficiency from 15 to 20 per cent. higher than the former cars and made phenomenal record for safety. Their success is best evidenced by their adoption as the standard city car of the system and the placing of an order for 100 Near-Side cars with the G. C. Kuhlman Car Company—delivery of which is about to be completed—and by an order for 100 similar cars to be built by The J. G. Brill Company for delivery during the present winter. The 161 Near-Side cars now in operation are running



mainly on the heaviest traffic lines, and when those now on order are delivered there will be sufficient Near-Side cars in service to take care of the daily traffic requirements, except during the "rush-hour" periods. The new cars are mounted on Brill No. 39-E single-motor trucks, have steel underframes and the Brill semi-convertible window system. Detailed descriptions of their constructive and operative features appeared in BRILL MAGAZINE for June, 1911, and May and December, 1912. For construction purposes the company uses two motor cranes, 10 motor and trailer flat and 54 dump cars.



## NOVEL PREPAYMENT CARS FOR MUSKOGEE, OKLAHOMA

THE Muskogee Electric Traction Company, Muskogee Oklahoma, recently received from the American Car Company 10 prepayment cars that embody several interesting departures from usual electric car design.

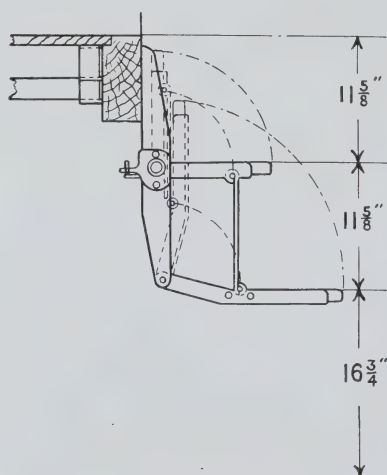
In 1900 Muskogee had a population of 4250, and in 1904 it had grown sufficiently to warrant the establishment of the street railway system; in 1912 there were 35,000 inhabitants. Ordinary single-truck open-platform cars gave the initial service, and later, single-truck prepayment cars, with open platforms, arranged for one-man operation, were placed on the lines. Their success led to the later adoption of single-truck prepayment cars of a more radical design, that were remarkable for their extremely light weight. Detailed descriptions of these cars were published in BRILL MAGAZINE for April, 1910, and December, 1911.

The 10 cars recently placed are mounted on Brill No. 62-E single-motor trucks. An extremely light weight for so large a car—45 feet over the bumpers—was secured through the use



CARS FOR MUSKOGEE. Wood bottom frame. All longitudinal upper framing continuous; corner posts,  $2\frac{1}{2}$  in.; side posts,  $1\frac{1}{2}$  in. Brill No. 62-E trucks

of flush, instead of drop, platforms and very light side and corner posts, the reduction of material in which is compensated for in continuous longitudinal body framing. The omission of bulkheads and the use of flush platforms, which are but five feet long, made possible a very large car body, with a total seating capacity for 52 persons, of whom 44 occupy Brill "Winner" cross seats, and 8, the longitudinal seats near each corner post. While the cars are arranged for prepay-



CARS FOR MUSKOGEE. Double folding steps work simultaneously with pivotal doors; operated by conductor through levers

ment operation, the usual railings are omitted, except a short one that separates entering and alighting passengers. The platforms are fitted with doors on both sides; a single sliding door, to the right of the motorman's position, being used for exit only, and two on the other side, for both entrance and exit, when the car is running in the opposite direction. The entrance and exit doors are pivoted and work in unison with double folding steps that were required in order to get as low a step eleva-



tion as possible with the necessarily high platforms. The rear entrance and exit doors and steps may be operated separately or together, and are manually controlled by the conductor through a simple system of levers; the sliding exit door at the front moves simultaneously with its double-folding steps at that point, and is controlled by the motorman. The bottom frames are entirely of wood and have



CARS FOR MUSKOGEE. Platforms flush; side sills run through between angle iron bumpers. Two pivotal doors and double folding steps operated in unison by conductor through levers. Usual prepayment railings omitted, except short railing on platform to separate boarding and alighting passengers

for their principal members  $3\frac{1}{2}$  by  $7\frac{3}{4}$ -in. yellow pine side sills;  $2\frac{1}{2}$  by 5 and  $2\frac{1}{2}$  by 3-in. end sills, one behind the other, and  $2\frac{1}{2}$  by 5-in. white oak crossings and a Brill angle-iron bumper at each end. All corners are substantially gusseted, and diagonal and transverse truss-rods are used in connection with under and upper trusses, to give the bottom framing ample stiffness in every direction. The corner posts are  $2\frac{1}{2}$ -in. thick, and the side posts  $1\frac{1}{2}$ -in. and have a sweep of  $2\frac{3}{4}$ -in.; in addition to being mortised into the side sills,



CARS FOR MUSKOGEE. Stationary upper sashes one-piece between corner posts; lower sashes are made to raise. No bulkheads. Seating capacity, 52

they are further secured by small forged pockets. While ordinarily posts of this thickness would hardly bear the strain of city service, the fact that all longitudinal members of the superstructure are made in one piece makes them approximately as strong as if twice their thickness. Advantage was taken of the reinforcing possibilities of the stationary upper sashes, which were accordingly made with lower rail in one piece, from corner post to corner post; the lower sashes are arranged to raise.

Length over corner posts . . . . .	34 ft. 0 in.	From floor to center of	
Length over platforms . . . . .	44 ft. 0 in.	headlining . . . . .	8 ft. 1 $\frac{3}{4}$ in.
Length of platforms . . . . .	5 ft. 0 in.	Step to step . . . . .	11 $\frac{5}{8}$ in.
Centers of side posts . . . . .	2 ft. 6 in.	Step to floor . . . . .	11 $\frac{5}{8}$ in.
Width over sills . . . . .	8 ft. 1 in.	Seating capacity . . . . .	52
Width over posts . . . . .	8 ft. 6 in.	Type of trucks . . . . .	Brill No. 62-E
From track to side sills . . . . .	2 ft. 6 $\frac{1}{4}$ in.	Wheel base . . . . .	4 ft. 6 in.
From side sills over trolley		Diameter of wheels . . . . .	33 and 24 in.
boards . . . . .	9 ft. 2 in.	Type of motors . . . . .	GE80—2
Track to step . . . . .	16 $\frac{3}{4}$ in.		



## INTERESTING PREPAYMENT CARS FOR MICHIGAN UNITED TRACTION COMPANY

### BRILL PLAIN-ARCH ROOF

THE G. C. Kuhlman Car Company recently built 20 interesting semi-steel prepayment cars for the Jackson lines of the Michigan United Traction Company, which operates the street railway lines in Lansing, Kalamazoo, Battle Creek and Jackson and the interurban lines between Owosso, Lansing, St. Johns, Jackson, Battle Creek, Kalamazoo and other cities in southern Michigan.

The new cars, which embody another application of the prepayment principle, are arranged for single-end operation, and that shown in the accompanying illustration is mounted on Brill No. 39-E single-motor trucks. The unusually large windows, which distinguished the former city cars of the Michigan United Traction Company, have given place to arch-top double-sash windows, measuring 2 ft. 7 in. between side post centers; the monitor roof, which was always used on the company's city cars, has been replaced by the plain-arch roof for its light weight, simple construction, strength and its adaptability to exhaust ventilation.



CARS FOR JACKSON. Single-end prepayment operation. Steel bottom frame and steel sides below belt rail riveted into one piece. Side and roof framing ash. Brill No. 39-E trucks

Except for the construction above the belt rail, the framing is all-steel. The bottom frame is made up of end sills of 10-in. channels which are riveted to an 8-in. channel center stringer with the flanges turned downward, and two 5 by 4 by  $\frac{3}{8}$ -in. angle side sills to which are riveted  $\frac{1}{8}$  by 36-in. "patent level" steel plates that form the straight car sides below the belt rail.



CARS FOR JACKSON. Pipe stanchions in lieu of bulkheads. Short pipe railing extends into car from conductor's position, from which he operates two sets two-leaf folding doors and folding steps. Longitudinal seats, 12; cross seats, 28; total, 40

This form of construction is obviously stiff, and practically provides a one-piece structure below the belt rail. The wooden side and corner posts are set into the side sill and fastened to the steel side plates with round-head bolts. Corrugated galvanized iron section of 20-gage is secured to the bottom frame members and supports composition flooring,  $\frac{5}{8}$ -in. thick at the thinnest point, and with no openings whatever. The platforms, which are supported by Brill truss knees, are vestibuled, have doors



on one side only, and lead directly into the body; there are no bulkheads. The usual railings used on prepayment platforms are provided, with the addition of one, projecting into the car, to divide incoming and outgoing passengers. The conductor's position is in the car, from which point he controls the two independently operated folding platform doors and folding steps by a simple manual lever arrangement. The front platform is separated from the body by two pipe stanchions, and exit is afforded through a single sliding door that is manually operated by the motorman.

The seating arrangement, which provides for 40 passengers, consists of two longitudinal seats at the rear, for 12 passengers, and 14 Brill stationary-back cross seats at the forward end, seating 28 persons. The arch-top windows have double-sash, the upper stationary and the lower arranged to raise. The interior is finished in mahogany. Sanitary hand straps, above the longitudinal seats, are among the accessories.

Length over corner posts . . . . .	28 ft. 0 in.	From floor to center of	
Length over platforms . . . . .	40 ft. 4 in.	headlining . . . . .	7 ft. 6 in.
Length of front platform . . . . .	5 ft. 10 in.	Seating capacity . . . . .	40
Length of rear platform . . . . .	6 ft. 6 in.	Type of trucks . . . . .	Brill No 39-E
Center of side posts . . . . .	2 ft. 7 in.	Weight of carbody, including	
Width over sills . . . . .	8 ft. 2 in.	heater and electric cables	18,000 lb.
Width over posts . . . . .	8 ft. 2 in.	Wt. of electrical equipment	6,752 lb.
Extreme width . . . . .	8 ft. 6 in.	Wt. of air and hand brake	
From track to trolley boards	11 ft. 2¾ in.	equipment and track scrap-	
From side sills over roof . . . . .	8 ft. 5¼ in.	ers . . . . .	2,135 lb.
		Wt. of trucks . . . . .	10,400 lb.



## INCLINE CARS FOR BAHIA, BRAZIL

TWO very interesting cars for cable elevation, over an 83½ per cent grade, were recently built for the Pilar Incline Railway, Bahia, Brazil, at the plant of The J. G. Brill Company. Coupled with the desire to maintain the lowest feasible center of gravity, was the further desire



INCLINE CARS. Hauled by cable up  $83\frac{1}{2}$  per cent grade. Truck supports body through sleeve-enclosed coil springs at corners. The middle seat is removable to form baggage space

to keep the floor of the car constantly level on the uniform but severe grade.

Heavy wheel pressures caused by the high track resistance in haulage against the grade, as well as flange pressures occasioned by any swaying motion, incident to the necessarily high location of the center of gravity, were among the chief factors influ-

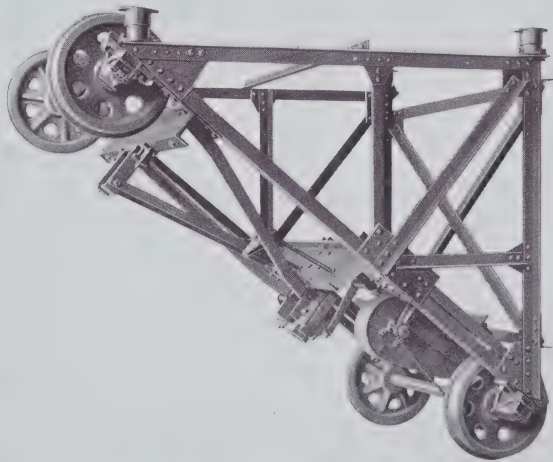
encing the design of the truck and body framing. Side sway had also to be carefully guarded against to insure the proper working of the safety devices.

The truck is built up of commercial structural steel shapes and at the side elevation presents a right triangle. The wheel base, measured along the inclined side sill, is 9 ft.  $95\frac{1}{32}$  in. The inclined side sills are 3 by 3 by  $\frac{3}{8}$ -in. angles and are 10 ft.  $95\frac{1}{32}$  in. long. The vertical sills over the lower journal boxes are 3 by 3 by  $\frac{3}{4}$ -in. angles, 6 ft. 8 in. long, and the horizontal truck-side sills, directly under the body, consist of 3 by 3 by  $\frac{3}{8}$ -in. angles, with a length of 8 ft. 2 in. A 3 by 3 by  $\frac{1}{4}$ -in. angle, 4 ft.  $65\frac{5}{8}$  in. in length, bisects the right angle of the framing, as shown in the accompanying photograph, and together with a horizontal and a vertical steel angle member, is riveted through a gusset plate to the inclined side sill, thereby



not only giving the framing vertical strength, but also forming a rigid support for the affixing of positive safety devices. Sufficient lateral bracing is obtained in the use of diagonal bracing and crossings in the vertical-end section of the framing. The entire framing gives the rigidity, with sufficient flexibility, that safety demands on a railroad of this character. The weight of the carbody is delivered to the truck at the four corners through coil springs that are placed within sliding sleeves, thus insuring permanent alignment, easy motion without vibration and logical distribution of weight.

The body proper ends at the two bulkheads, each of which holds a stationary window of clear glass, in three units, the single arch top of which consists of three pieces of frosted glass. Backed against the inner side of each bulkhead are non-reversible seats, and between these two are three of the reversible type. All seats are supported on Brill round-corner seat-end panels. In addition to the four ash corner posts, there are two side posts at the seat-end panels of two of the reversible seats, on either side of the car, but none at the center seat. A side post was omitted here so that the seat might be removed and the space reserved for freight or baggage to a maximum lading of 1000 pounds. The framing under the letter



INCLINE CARS. Framing of commercial shapes. Long wheel base places journals under body springs. Diagonal bracing for stability to insure operation of safety devices

board is of southern yellow pine, into which are secured ash carlines that support the Brill plain arch roof. Striped duck curtains sliding between the side posts may be used in inclement weather. Two pantagraph trolleys on the roof supply lighting current at 110 volts a.c., from wires that run parallel to the track the entire length of the road.

The two cars run on parallel tracks, each having its own station platforms at the base and summit of the grade. One car is provided with a stationary wire mesh guard rail on the left and a yellow pine rail, that may be raised and lowered, on the right or platform side, while the equipment of the other is the reverse.

With an interior finish of ash and cherry and no headlining under the roof, and an exterior body color of deep red, these cars present a pleasing and well-balanced appearance. Their logical construction and the use of tried safety devices anticipate safe and satisfactory operation.

Length of body . . . . .	12 ft. 8 in.	Type of truck . . . . .	Running Gear
Centers of side posts . . . . .	$\left\{ \begin{array}{l} 2 \text{ ft. 6 in.} \\ 3 \text{ ft. 10 in.} \end{array} \right.$	Wheel base . . . . .	9 ft. $9\frac{5}{16}$ in.
Width over sills . . . . .	6 ft. $7\frac{1}{4}$ in.	Diameter of wheels . . . . .	24 in.
Width over posts . . . . .	6 ft. $9\frac{1}{2}$ in.	Size of journal . . . . .	$2\frac{3}{4}$ by $6\frac{3}{4}$ in.
Extreme width . . . . .	6 ft. $11\frac{1}{2}$ in.	Weight of carbody . . . . .	2,300 lb.
Seating capacity . . . . .	20	Weight of truck . . . . .	4,020 lb.



## PREPAYMENT CARS FOR SPRINGFIELD, ILLINOIS

### BRILL STATIONARY BACK SEATS

THE Springfield Consolidated Railway Company, Springfield, Illinois, recently received seven prepayment cars, for single-end operation, from the American Car Company. Reports from the railway company indicate a material reduction in platform accidents, as compared with the old style cars that have been replaced.



The bodies are mounted on Brill No. 39-E single-motor trucks, and have steel bottom frames which include an 8-in. channel center stringer and 4 by 7 $\frac{3}{4}$ -in. yellow pine side sills set in Z-bars and reinforced by  $\frac{3}{8}$  by 15-in. steel sill plates. In addition to two truss-form body bolsters and 9-in. end channels, with yellow pine filler, there are nine 4-in. channel crossings, with wood filler, for attaching the floor. The crossings are riveted to the Z-bars through large gusset plates to which diagonal braces also are attached. These braces consist of 3 by  $\frac{5}{16}$  in. flat bars which are placed between the two bolsters and between the bolsters and the end sills. The platform bottom framing is supported on Brill patented truss knees, that are hung so as to bring the platform floor nine inches lower than the floor in the body. Two angles that extend from the end sill to the crown piece form the center longitudinal platform framing, and the end of each platform is protected by a Brill angle iron bumper.

The body framing consists of ash side and corner posts, having a sweep of two inches, yellow-pine bracing below the belt rail, and a yellow pine top rail the entire length of the car. Composite car lines are secured to the side posts and support a monitor roof, the deck sashes in which are arranged for ventilation. The rear bulkhead has two sliding doors, each



CARS FOR SPRINGFIELD. Single-end prepayment car with composite bottom frame. Folding doors and steps front and rear. Glazed panel between front door and front corner post. Standard Brill No. 39-E single-motor trucks

24-in. wide, and leading to the prepayment platform. On the entrance and exit side of the vestibuled rear platform there are two sets of two-leaf folding doors and folding steps, controlled by means of a simple lever system. In the front bulk-head there is one door at the right side, which leads to the front platform. A motorman's cab occupies



CARS FOR SPRINGFIELD. Twelve rattan-covered cross seats for 24 passengers; four longitudinal seats, 19: total, 43. Partition on front platform reserves left half as motorman's cab

the left half of this platform, and may be entered from the other half through a sliding door, with wire glass panels. A two-leaf folding door and folding step are provided at the front exit, and are controlled by the motorman. Between this door and the body corner post is a narrow glazed side panel that takes up the slight extension in the platform length, without unduly increasing the width of the door opening.

The windows in the body have double sash, the lower being



made to raise until level with the upper stationary sash, while those in the vestibules also have double sash, with the upper stationary, but with the lower arranged to drop. Twelve rattan-covered stationary back cross seats with grab handles, and mounted on pressed steel pedestals, and four longitudinal seats, afford seating capacity for 43 passengers. The interior woodwork is in cherry, and all trimmings are bronze.

Length over corner posts . . . . .	30 ft. 8 in.	From floor to center of	
Length over platforms . . . . .	42 ft. 0 in.	headlining . . . . .	8 ft. 0½ in.
Length of front platform . . . . .	4 ft. 10½ in.	From track to step . . . . .	15¾ in.
Length of rear platform . . . . .	6 ft. 5½ in.	Step to platform . . . . .	14½ in.
Centers of side posts . . . . .	2 ft. 8 in.	Platform to floor . . . . .	9 in.
Width over sills . . . . .	7 ft. 11½ in.	Seating capacity . . . . .	43
Width over posts . . . . .	8 ft. 2 in.	Type of trucks . . . . .	Brill No. 39-E.
Extreme width . . . . .	8 ft. 5 in.	Wheel base . . . . .	4 ft. 6 in.
From track to side sills . . . . .	2 ft. 8¼ in.	Diameter of wheels . . . . .	33 and 21 in.
Side sills over trolley boards . . . . .	8 ft. 11¾ in.	Type of motors . . . . .	GE219—2-hp.



## HANDSOME INTERURBAN PASSENGER AND BAGGAGE CARS FOR ILLINOIS RAILWAY

### BRILL "EXHAUST" VENTILATORS

THE Illinois Central Electric Railway, which operates an interurban line between Norris, Brereton, Canton, St. David, Gilchrist, Maplewood and Farmington, Illinois, recently placed in service two handsome combination passenger and baggage interurban cars, built by the American Car Company. They were built for high speed service and are equipped with M.C.B. couplers to enable interchange of equipment with connecting steam railroads.

The cars are very large and roomy and are divided into a passenger and baggage compartment, the latter being 9 ft. 6 in. long and having a 48-in. baggage door on each side. The



CARS FOR ILLINOIS. Pullman windows, with stationary cathedral-glass upper sashes; lower sashes raise. Baggage compartment, 9 ft. 6 in. long; 48-in. door. Composite under-frame. Brill No. 27-M.C.B.3X trucks

interior finish is of mahogany and the twin-window arrangement enhances the appearance of both the exterior and interior. The windows have double sashes, the upper being stationary with arch tops covering the width of two sashes, and are glazed with opalescent glass; the lower, which are glazed with clear glass, are made to raise. The seats are all of the high-back type, upholstered in genuine leather of a color harmonizing with the mahogany finish. Thirteen seats on one side, and 14 on the other, are of the Brill "Winner" type and accommodate 54 passengers, in addition to which there are two longitudinal seats for four passengers. The Brill plain-arch roof adds much to the appearance of the interior, and all fittings, including the baggage racks, being in polished bronze, are in keeping with the richness of the mahogany finish. The baggage compartment is fitted with wooden slat seats that may be folded out of the way when the space is otherwise needed. The round-end vestibules are fitted with folding doors, 30-in. wide, and with triple-tread steam-coach steps.

The bottom frame is composite and includes  $4\frac{1}{4}$  by  $7\frac{3}{4}$ -in. yellow pine side sills, and 3 by  $5\frac{3}{4}$ -in. sub-sills, reinforced with



$\frac{3}{8}$  by 18-in. steel plate; 6-in. I-beams, with oak filler, which form the two center and two intermediate stringers, project beyond the vestibules to support the Brill angle-iron bumpers and anti-climbers;  $4\frac{1}{2}$  by  $7\frac{1}{2}$ -in. oak end sills, enclosed in  $\frac{1}{2}$  by 6-in. steel plate, bent around to form channels, are securely bolted to the side sills and stringers. Oak crossings and needle beams give lateral bracing, and transverse truss rods reinforce the built-up body bolsters. Upper trusses, concealed in the car sides and anchored under the side sills, as well as under trusses, prevent horizontal deflection. The corner posts are  $17\frac{1}{8}$  in., and the side posts alternately  $2\frac{1}{4}$  and  $10\frac{3}{4}$  in. thick and are mortised and tenoned into the side sills in the usual manner.

The two cars are mounted on Brill No. 27-M.C.B.3X trucks, which are capable of a speed of 70 miles per hour and have



CARS FOR ILLINOIS. Lavatory in left corner; individual parcel racks. Brill "Winner" seats  
Seating capacity, 58

solid forged side frames, the pedestal jaws and extensions of which are integral parts of the forgings.

Length over corner posts . . . . .	47 ft. 10½ in.	From track to side sills . . . . .	3 ft. 6½ in.
Length over platforms . . . . .	57 ft. 10½ in.	From floor to center of head-	
Length of platforms . . . . .	5 ft. 0 in.	lining . . . . .	8 ft. 1¾ in.
Length of baggage compart-		Track to step . . . . .	15½ in.
ment . . . . .	9 ft. 6 in.	Step to step . . . . .	11½ in.
Length of main compartment . . . . .	38 ft. 4½ in.	Step to floor . . . . .	11½ in.
Centers of side posts . . . . .	30 ft. 0 in.	Seating capacity . . . . .	58
Width over sills . . . . .	9 ft. 1 in.	Type of trucks . . . . .	Brill 27-M.C.B.3X
Width over posts . . . . .	9 ft. 1 in.	Wheel base . . . . .	6 ft. 6 in.
From side sills over trolley		Diameter of wheels . . . . .	36 in.
boards . . . . .	9 ft. 4 in.	Type of motors . . . . .	GE-210—4



## COMBINATION BAGGAGE AND FREIGHT CAR—TOLEDO & WESTERN RAILROAD

### FOR SINGLE-END OPERATION

THE Toledo & Western Railroad Company, Toledo, Ohio, recently received an interesting combination baggage and freight car, for single-end operation, from the G. C. Kuhlman Car Company, which is being used in package freight service between Toledo, Ohio, and Morenci, Michigan, a distance of 39.3 miles. The lines of the Toledo & Western



CARS FOR TOLEDO & WESTERN. For single-end operation; averages 100 miles per day, often hauling steam freight cars. Bottom frame of I-beams and cast separators for crossings. Diagonal bracing in body





CARS FOR TOLEDO & WESTERN. Side doors 5 ft. 6 in. wide; entrance doors at diagonally opposite corners, 3 ft. wide. Meat racks along sides. Three windows with drop sashes in front vestibule; two similar windows in rear

Railroad extend from Toledo, through Sylvania and Allen Junction, Ohio, to Morenci, Michigan, Alvordton and Pioneer, Ohio, with a branch line from Allen Junction to Adrian, Michigan. Through its greater part the route traverses an undulating farming country, following closely the Ohio-Michigan state line.

The new car covers approximately 100 miles a day, including switching movements, and because of the volume of freight being handled, it is often necessary to haul several standard steam railroad box cars. These conditions require the staunch design employed, in which the steel bottom frame consists of two 8-in. side sills of channel section, with two 8-in. I-beam center stringers and two intermediate stringers of 6-in. I-section. The heavy double center stringers give a

firm support to the M. C. B. draft-gear attachments, which are used to meet these conditions—similar to those found on steam railroads. The end sills are 8-in. I-beams, the crossings are made up of cast separators between the stringers, and the body bolsters of two 1 by 10-in. steel plates, there being malleable iron spacers between them, over the center plates. A solid oak bumper, sheathed with  $\frac{1}{2}$ -in. steel, is secured to each end of the car, the steel plate extending several inches along the sides.

The vertical members of the upper framing are securely tied by diagonal bracing, to compensate for the door openings, there being two sliding baggage doors, each 5 ft. 6 in. wide, and swinging doors, 3 ft. wide, at diagonally opposite corners near the ends. The interior is lined with narrow tongued and grooved boards. There are three windows in the front vestibule, with single sashes made to drop, two with similar sashes in the rear, and in each door the upper panels are glazed. Between the baggage doors, on each side, there is a bar, 15 ft. long, fitted with meat hooks. The exterior is sheathed with tongued and grooved boards, and the bottoms and lower halves of the sides of the door openings are protected with steel.

Length over bumpers . . .	50 ft. 0 in.	From side sills over trolley boards . . . . .	8 ft. 4 $\frac{3}{4}$ in.
Length over vestibule sheathing . . . . .	48 ft. 6 in.	From floor to rafters . . .	7 ft. 4 $\frac{1}{4}$ in.
Centers of side posts . . .	2 ft. 8 $\frac{1}{4}$ in.	Wt. of body less electrical equipment . . . . .	22,920 lb.
Width over side sills . . .	8 ft. 1 in.	Total weight . . . . .	43,380 lb.
Extreme width . . . . .	8 ft. 3 $\frac{1}{2}$ in.		
From track to side sills . .	3 ft. 7 $\frac{3}{4}$ in.		



## SUBURBAN CARS FOR NAZARETH, PA.

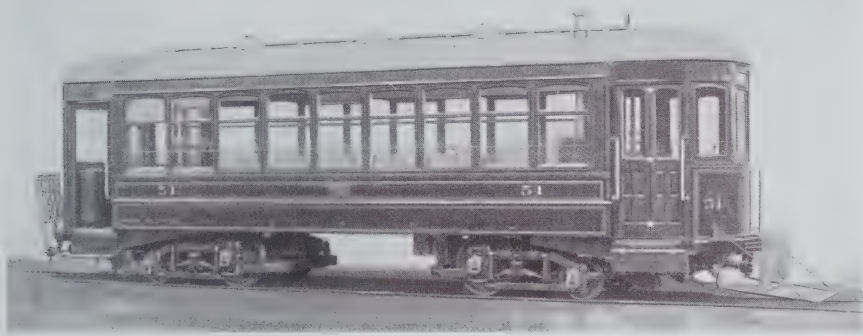
### BRILL No. 39-E TRUCKS

TWO double-truck suburban cars were recently built for the Allen Street Railway Company by The J. G. Brill Company for service between Nazareth and Bath, Pa., a distance of  $5\frac{1}{4}$  miles. The line is single-track and traverses



a rolling country that is rich in deposits of argillaceous limestone, the chief ingredient of portland cement. The profile favors movement toward Bath, which is about 500 feet lower than Nazareth, and shows a maximum grade of eight per cent, from 500 to 600 ft. long, and a 50-ft. radius at the sharpest curve.

There are six large cement works along the route that are the source of greatest traffic. Before the new cars were put on, small single-truck cars, whose capacities were soon over-



CARS FOR NAZARETH. Operate on 5.17-mile line through Pennsylvania cement region. Carry light express matter besides passengers. Brill No. 39-E trucks

taxed, were the only rolling stock and showed the urgent need of additional equipment. Operation is somewhat hampered by the fact that about half way between Nazareth and Bath a spur of the Lehigh & New England Railway cuts the electric line in two. The cars are now being operated on an hourly schedule, but owing to the break in the track both cars are required for each one-way trip, it being advisable to run one car from one of the terminals to the railroad crossing, transfer passengers and crew to the other, which waits at the other side of the steam road track, and then proceeds to the other terminal.

In addition to passengers, small packages are handled by motormen for 5 cents per trip, and an interchange plan has been arranged with the Lehigh Valley Transit Company

whereby a limited quantity of light express matter is taken.

The two new cars are mounted on Brill No. 39-E single-motor trucks and have staunch wooden bottom frames with 4 by 7 $\frac{3}{4}$ -in. yellow pine side sills, reinforced on the inside by 3 by 12-in. steel plates; 5 $\frac{1}{4}$  by 6 $\frac{7}{8}$ -in. oak end sills, similarly reinforced; 3 $\frac{1}{2}$  by 5 $\frac{7}{8}$ -in. oak crossings and 4 $\frac{1}{2}$  by 2 $\frac{3}{4}$ -in.



CARS FOR NAZARETH. Upper sash stationary; lower made to drop. Seating capacity, 32. Ventilated by Brill "Exhaust" ventilators

diagonal braces between the body bolsters. Center stringers were omitted because of the small overall length of the car—34 ft. 9 in.—and because the side sills are amply strong to carry the load. As an extra reinforcement, however, a 2 $\frac{3}{4}$  by 2 $\frac{1}{4}$ -in. cross joist is placed next to each body bolster, and this is joined to the next crossing with two 2 $\frac{3}{4}$  by 1 $\frac{3}{4}$ -in. tees.

The side and corner posts are of straight-grained ash, and have a sweep of 1 $\frac{3}{4}$  in. Each vestibule has three windows,

the two outer having the usual drop sash and that at the center arranged to be held at various heights. Below the windows is wood sheathing, and the four platform entrances are provided with two-leaf folding doors and folding steps operated in unison. The bulkheads have mutually-operated double sliding doors, the pockets for which provide bulkhead windows. There are ten reversible rattan-covered Brill "Winner" seats and the usual longitudinal seats in the four corners, providing a total seating capacity for 32 persons. All windows are arranged with double sash, the upper being stationary and the lower made to drop. The cars are fitted with Brill "Exhaust" ventilators, alarm gongs, signal bells, sand boxes and track scrapers.

Length over corner posts . . . . .	25 ft. 4 in.	Seating capacity . . . . .	32
Length over platforms . . . . .	34 ft. 9 in.	Type of trucks . . . . .	Brill No. 39-E
Length of platform . . . . .	4 ft. 8½ in.	Wheel base . . . . .	4 ft. 6 in.
Centers of side posts . . . . .	2 ft. 8 in.	Diameter of wheels . . . . .	33 in. and 21 in.
Width over sills . . . . .	7 ft. 10½ in.	Type of motors . . . . .	West. 101B2—2-50 hp.
Width over posts . . . . .	8 ft. 2 in.	Weight of carbody less electrical equipment . . . . .	14,500 lb.
From track to side sills . . . . .	2 ft. 7¾ in.	Wt. of electrical equipment . . . . .	1,100 lb.
Track to step . . . . .	15¾ in.	Weight of trucks . . . . .	10,000 lb.
Step to platform . . . . .	14½ in.	Weight of motors . . . . .	5,500 lb.
Platform to floor . . . . .	8½ in.		



## CLOSED CARS FOR NEW JERSEY SHORE RESORTS

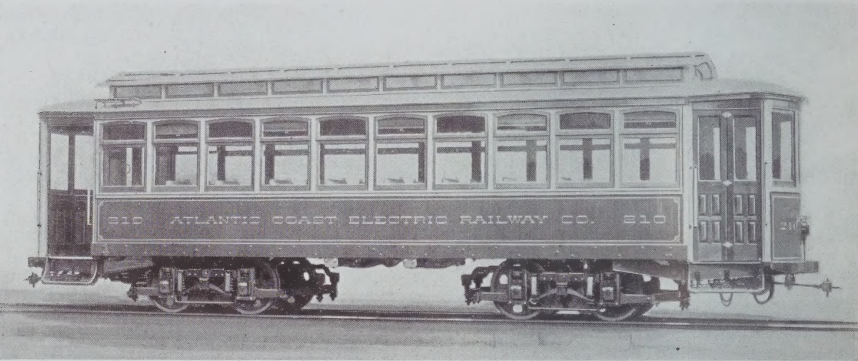
### BRILL "WINNER" SEATS

**A** FEW months ago The J. G. Brill Company delivered three closed cars to the Atlantic Coast Electric Railway Company, which operates the electric lines along the shore of northern New Jersey, passing through a series of veritable cottage cities, with a total summer population of about 175,000, including Pleasure Bay, Long Branch, West End, Elberon, Deal Beach, Interlaken, Asbury Park and Ocean Grove, Avon, Belmar, Spring Lake and numerous other



places. The railway has its northern terminal at Pleasure Bay, where large crowds are handled from early spring until late fall. The southern terminal is at Sea Girt, which is well known for the annual encampments of the New Jersey militia. Traffic on the entire system is very heavy in summer.

The three cars are mounted on Brill No. 27-G1 short wheel-base pivotal trucks and have wooden bottom frames with 4¾ by 7¾-in. yellow pine side sills, reinforced with ½ by 7-in. steel sill plates; 3½ by 4¼-in. oak crossings and 5¼ by



CARS FOR NEW JERSEY SHORE RESORTS. Operated through resort region with about 175,000 summer population. Mounted on Brill No. 27-G1 trucks

7¾-in. oak end sills and are braced by upper and transverse truss rods. They are vestibuled and have Brill "Winner" transverse seats, with longitudinal corner seats, having capacity for 40 persons; double-sash windows, with upper sashes stationary and the lower arranged to drop. The design conforms to that of other cars in service on the company's lines.

Length over corner posts . . . . .	28 ft. 0¼ in.	Seating capacity . . . . .	40
Length over platforms . . . . .	37 ft. 0¼ in.	Type of trucks . . . . .	Brill No. 27-G1
Length of platforms . . . . .	4 ft. 6 in.	Wheel base . . . . .	4 ft. 0 in.
Centers of side posts . . . . .	2 ft. 9½ in.	Diameter of wheels . . . . .	33 in.
Width over sills . . . . .	8 ft. 1 in.	Size of journals . . . . .	3¾ x 7 in.
Width over posts . . . . .	8 ft. 4 in.	Type of motors . . . . .	West. 12A—4-25-30 hp.
Extreme width . . . . .	8 ft. 4 in.	Weight of carbody less elec. equipment . . . . .	14,000 lb.
From track to side sills . . . . .	2 ft. 6½ in.	Weight of elec. equipment . . . . .	1,300 lb.
From side sills over trolley boards . . . . .	11 ft. 5 in.	Wt. of air-brake equipment . . . . .	1,500 lb.
Track to step . . . . .	15¼ in.	Weight of trucks . . . . .	12,040 lb.
Step to platform . . . . .	14 in.	Weight of motors . . . . .	8,800 lb.
Platform to floor . . . . .	9 in.		

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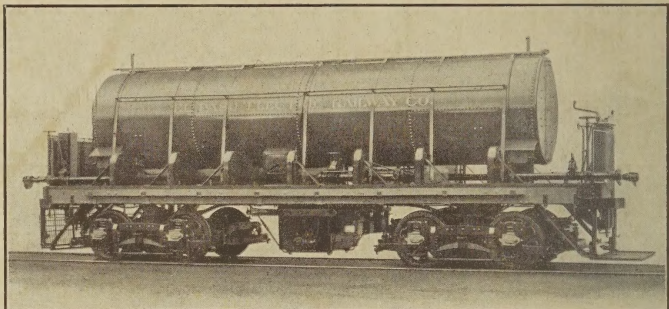
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## THE BRILL CENTRIFUGAL SPRINKLER

The direct and indirect profits from street sprinkling are astonishing. And it isn't the direct monetary gain due to sprinkling alone that counts the whole profit, but the better feeling of city authorities, the increased riding habit, and the reduced maintenance through the elimination of dust and dirt and the consequent longer life of parts, make street sprinkling an attractive proposition. Records show horse-cart sprinkling to cost about 60 cents a mile; a Brill Centrifugal Sprinkler costs a railway about 26 cents a mile, including all operating expenses. A contract with your city at 40 cents a mile for 100 miles for six months means \$5,000 a year extra profit with little exertion and without interference with schedules. Our Centrifugal Sprinkler Catalog gives some interesting figures.

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